

CLAIMS:

What is claimed is:

1. A pickup for electric guitars, comprising:

- (a) an upper bobbin,
- (b) a lower bobbin beneath said upper bobbin,
- (c) an upper wire coil in said upper bobbin,
- 5 (d) a lower wire coil in said lower bobbin,
said coils being substantially matched to each
other and oppositely wound,
- (e) a plurality of elongate permanent-magnet pole pieces
extending through said bobbins and coils,
10 said pole pieces all having their north poles
uppermost, and
- (f) a ferromagnetic plate,
said plate being disposed between said bobbins
and parallel to said coils and including
15 longitudinal ends situated approximately below
said upper wire coil,
said pole pieces being substantially perpendicular
to said plate, and
said plate being generally midway between the
ends of said pole pieces.

20 2. The invention as claimed in claim 1, wherein said ferromagnetic plate is
at least .100 inch thick.

3. The invention as claimed in Claim 1, in which said plate has a thickness
in the range of about .125 inch to about .187 inch.

4. The invention as claimed in Claim 1, in which said plate does not connect to any ferromagnetic portion that extends upwardly to the elevation of the upper end portions of said pole pieces.

5. The invention as claimed in Claim 1, in which said plate does not connect to any ferromagnetic portion that extends downwardly to the elevation of the lower end portions of said pole pieces.

6. The invention as claimed in Claim 1, in which said plate does not connect to any ferromagnetic portion that extends upwardly to the elevation of the upper end portions of said pole pieces, and in which said plate does not connect to any ferromagnetic portion that extends downwardly to the elevation of the lower end
5 portions of said pole pieces.

7. The invention as claimed in Claim 1, in which at least said upper bobbin has holes therein generally between at least some of said pole pieces, and in which ferromagnetic slugs are mounted in at least some of said holes.

8. The invention as claimed in Claim 1, in which screws are provided to hold said bobbins, pole pieces and plate together, said screws being ferromagnetic.

9. The invention as claimed in Claim 1, in which each of said bobbins has an outer plate but does not have an inner plate, and in which said coils have inner portions that are closely adjacent opposed surfaces of said ferromagnetic plate.

10. The invention as claimed in Claim 1, further including a pair of steel plates attached to both longitudinal sides of one of the bobbins and extending towards the opposing bobbin past the ferromagnetic plate and not in electrical contact therewith.

11. A pickup for an electric guitar, which comprises:

- (a) at least several highly elongate permanent-magnet pole pieces mounted in spaced parallel relationship to each other and generally coextensive with each other,
 - all of said pole pieces having their north ends uppermost,
 - (b) a first coil of wire wound in one direction,
 - (c) a second coil of wire wound in the direction opposite to said one direction,
 - said coils being generally matched to each other,
 - said first coil being mounted around upper portions of said pole pieces,
 - said second coil being mounted around lower portions of said pole pieces,
 - said first and second coils being electrically connected to each other in opposed relationship so as to create a humbucking effect,
 - said first and second coils being substantially parallel to each other and being spaced a substantial distance from each other, and
 - (d) a ferromagnetic plate mounted between said first and second coils and substantially parallel thereto and including longitudinal ends situated approximately below said first coil,
 - said pole pieces being substantially perpendicular to said plate,
 - said pole pieces extending through said plate,
 - said plate being substantially halfway between the ends of said pole pieces.

12. The invention as claimed in Claim 11, wherein said ferromagnetic plate is at least .100 inch thick.

13. The invention as claimed in Claim 11, in which said plate has a thickness in the range of about .125 inch to about .187 inch.

14. The invention as claimed in Claim 11, in which said plate does not connect to any ferromagnetic portion that extends upwardly to the elevation of the upper end portions of said pole pieces.

15. The invention as claimed in Claim 11, in which said plate does not connect to any ferromagnetic portion that extends downwardly to the elevation of the lower end portions of said pole pieces.

16. The invention as claimed in Claim 11, in which said plate does not connect to any ferromagnetic portion that extends upwardly to the elevation of the upper end portions of said pole pieces, and in which said plate does not connect to any ferromagnetic portion that extends downwardly to the elevation of the lower end
5 portions of said pole pieces.

17. The invention as claimed in Claim 11, in which at least said upper bobbin has holes therein generally between at least some of said pole pieces, and in which ferromagnetic slugs are mounted in at least some of said holes.

18. The invention as claimed in Claim 11, in which screws are provided to hold said bobbins, pole pieces and plate together, said screws being ferromagnetic.

19. The invention as claimed in Claim 11, in which each of said bobbins has an outer plate but does not have an inner plate, and in which said coils have inner portions that are closely adjacent opposed surfaces of said plate.

20. The invention as claimed in Claim 11, further including a pair of steel plates attached to both longitudinal side of one of the bobbins and extending towards the opposing bobbin past the ferromagnetic plate and not in electrical contact therewith.

21. A pickup for an electric guitar, which comprises:
- (a) at least several highly elongate permanent-magnet pole pieces mounted in spaced parallel relationship to each other and generally coextensive with each other,
 - 5 all of said pole pieces having their north ends uppermost,
 - (b) a first coil of wire wound in one direction,
 - (c) a second coil of wire wound in the direction opposite to said one direction,
 - 10 said coils being generally matched to each other,
 - 15 said first coil being mounted around upper portions of said pole pieces,
 - 20 said second coil being mounted around lower portions of said pole pieces,
 - 25 said first and second coils being electrically connected to each other in opposed relationship so as to create a humbucking effect,
 - (d) said first and second coils being substantially parallel to each other, and
 - 25 a ferromagnetic plate mounted between said first and second coils and substantially parallel thereto and including longitudinal ends situated approximately below said first coil,
 - 30 said pole pieces being substantially perpendicular to said plate,
 - 35 said pole pieces extending through said plate,
 - 40 said plate being substantially halfway between the ends of said pole pieces,
 - (e) first and second nonmagnetic and nonmagnetizable bobbins mounted one above the other and respectively receiving said coils,

at least one of said bobbins having a hole therein between two adjacent ones of said pole pieces, and

- (f) a ferromagnetic slug mounted in said hole.

22. A method of transducing into electrical signal the vibrations of guitar strings, and of substantially eliminating noise from electromagnetic and other noise sources, said method comprising:

- (a) providing a highly elongate permanent-magnet pole piece for each string of the guitar and extending downwardly from a point that is relatively close to the string but is at least sufficiently far therefrom to permit the string to vibrate,
the north pole of each pole piece being uppermost,
- (b) providing upper and lower oppositely wound and generally matched electrical coils around the upper and lower portions of said pole pieces,
- (c) providing a ferromagnetic plate between said coils and substantially parallel to said coils and substantially midway between the ends of said pole pieces, said ferromagnetic plate having longitudinal ends situated approximately below said upper coil, and
- (d) causing said plate to be sufficiently thick that the lines of magnetic force of said pole pieces are in two separate paths, the lines from the north poles of said magnets going through the side of said plate nearest the guitar strings, and the lines from the south poles going through the side of said plate farthest from the guitar strings.

23. A combination comprising:

a guitar; and

a pickup mounted on said guitar comprising:

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- a. at least several highly elongated permanent-magnet pole pieces for electromagnetically sensing vibrations of the strings, the pole pieces being mounted in spaced parallel relationship to each other and generally coextensive with each other,
all of said pole pieces having their north ends uppermost,
- 10 b. a first coil of wire wound in one direction,
- c. a second coil of wire wound in the direction opposite to said one direction,
said first coil being mounted around upper portions of said pole pieces,
said second coil being mounted around lower portions of said pole pieces,
said first and second coils being electrically connected to each other in opposed relationship so as to create a humbucking effect,
said first and second coils being substantially parallel to each other, and
- 15 d. a ferromagnetic plate mounted between said first and second coils and substantially parallel thereto and including longitudinal ends situated approximately below said first coil,
said pole pieces being substantially perpendicular to said plate, said pole pieces extending through said plate,
- 20 e. first and second nonmagnetic and nonmagnetized bobbins mounted one above the other and respectively receiving said coils,
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at least one of said bobbins having a hole therein

between two adjacent ones of said pole pieces, and

- f. a ferromagnetic slug mounted in said hole.